

REMARKS

Claims 5, 7-8, and 10 are currently pending in the application. Claims 5 and 7-8 have been amended. Claims 1-4, 6, and 9 have been canceled. Claim 10 has been added. Applicant respectfully submits that no new matter has been added. Reconsideration of the application as amended is respectfully requested.

Claims 1, 3, and 9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,464,767 to Bremer ("Bremer"). Claims 1, 3, and 9 have been canceled, thus rendering the rejection thereof moot.

Claims 1-2 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,141,387 to Zhang ("Zhang") in view of Bremer. Claims 1-2 and 9 have been canceled, thus rendering the rejection thereof moot.

Claims 4 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang and Bremer and further in view of U.S. Patent No. 5,343,499 to Jasper et al. ("Jasper"). Claim 4 has been canceled, thus rendering the rejection thereof moot.

Independent claim 7 relates to a multiplexing QAM demodulation apparatus. Applicant respectfully submits that the cited combination of Zhang, Bremer, and Jasper fails to disclose at least one of the distinguishing features of independent claim 7, namely, a judgment unit adapted to estimate individual symbol positions which appear in a received multiplexed QAM-modulated wave based on both a symbol position arrangement of the multiplexed QAM-modulated wave and a characteristic of a transmission line. In addition, the cited references fail to disclose that the judgment unit is adapted to determine a most probable symbol position based on distances between the estimated individual symbol positions and a symbol position of the reception signal and a plurality of input data from the determined most probable symbol position. Furthermore, the cited references fail to disclose a demodulation unit adapted to first estimate a multiplexed input data having been given a larger modulated wave gain in multiplexing and then estimate remaining input data while eliminating improbable symbol positions from the estimated multiplexed input data.

Zhang discloses a QAM modulator implemented with a reduction in a total number of binary parallel multipliers. To increase operational throughput, the speed of operation increases with a use of LUTs (look-up tables) storing precomputed filter weighting coefficients. The reduction in multipliers is also achieved by using post filtering carrier combination which similarly reduces a number of MAC operations performed during filtering.

Bremer discloses QAM data transmitters and further discloses a system for synchronously utilizing multiple low speed data transmitters to obtain high speed transmissions. The system is adapted for data transmission wherein existing circuit elements are tied together in such a fashion as to increase their operational rate without requiring any major modification of the basic elements.

Jasper discloses a method of permitting simplified acquisition of timing and frequency synchronization by a QAM receiver. The method includes providing a signal vector synchronizing sequence that is a stream of QAM signal elements, to a QAM information signal, and in particular to substantially each QAM channel of a multi-carrier QAM system. The synchronizing sequences are selected to minimize computation time required by a QAM receiver.

In contrast to independent claim 7, Applicant respectfully submit that neither Zhang, Bremer nor Jasper discloses a judgment unit adapted to estimate individual symbol positions which appear in a received multiplexed QAM-modulated wave based on both a symbol position arrangement of a multiplexed QAM-modulated wave and a characteristic of a transmission line. In addition, neither Zhang, Bremer nor Jasper discloses a demodulation unit adapted to first estimate the multiplexed input data having been given a larger modulated wave gain in multiplexing and then estimate remaining input data while eliminating improbable symbol positions from the estimated multiplexed input data. Zhang only discloses estimating individual symbol position being received but fails to disclose estimating individual symbol positions which appear in a received multiplexed QAM-modulated wave based on both a symbol position arrangement of the multiplexed QAM-modulated wave and a characteristic of a transmission line

as claimed. Bremer and Jasper fail to cure the deficiencies of Zhang noted above. Applicant respectfully submits that independent claim 7 distinguishes over Zhang, Bremer, and Jasper and respectfully requests that the rejection thereof be withdrawn.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bremer. Dependent claim 8 depends from and further restricts independent claims 7 in a patentable sense. Applicant respectfully submits that, for at least the reasons set forth above with respect to the rejection of independent claim 7, dependent claim 8 distinguishes over Bremer and is in condition for allowance. Withdrawal of the rejection of dependent claim 8 is respectfully requested.

Claims 5-6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bremer and further in view of Jasper and U.S. Publication No. 2004/0017857 to Chouly et al. ("Chouly"). Claim 6 has been canceled, thus rendering the rejection thereof moot.

Independent claim 5 relates to a multiplexing QAM demodulation apparatus. Applicant respectfully submits that the cited combination of Bremer, Jasper, and Chouly fails to disclose at least one of the distinguishing features of independent claim 5, namely, a probability calculating unit adapted to calculate probabilities of a reception signal corresponding to respective symbol positions based on variance of symbol positions caused by a transmission line. In addition, the cited references fail to disclose an expectation value calculating unit adapted to calculate an expectation value of each of the plurality of differential-gain-multiplexed input data based on the calculated probabilities and a demodulation unit adapted to estimate the multiplexed input data based on an expectation value of the multiplexed input data.

In contrast to independent claim 5, Applicant respectfully submit that neither Bremer, Jasper, nor Chouly discloses an expectation value calculating unit adapted to calculate an expectation value of each of the plurality of differential-gain-multiplexed input data based on the calculated probabilities. Jasper only teaches techniques of timing and frequency synchronization but fails to disclose calculating an expectation value as claimed. In addition, Chouly discloses calculating probabilities for each symbol using probability computations means and

demodulating a symbol having a largest probability but fails to disclose calculating an expectation value as claimed. Bremer fails to cure the deficiencies of Jasper and Chouly noted above. Applicant respectfully submits that independent claim 5 distinguishes over Bremer, Jasper, and Chouly and respectfully requests that the rejection thereof be withdrawn.

Newly added claim 10 depends from and further restricts independent claims 5 in a patentable sense. Applicant respectfully submits that, for at least the reasons set forth above with respect to the rejection of independent claim 5, dependent claim 10 distinguishes over the cited references and is in condition for allowance.

In view of the above amendment, Applicant respectfully submits that the present application is in condition for allowance. A Notice to that effect is respectfully requested.

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Respectfully submitted,

Electronic signature: /Shoaib A. Mithani/
Shoaib A. Mithani

Registration No.: 61,654
WINSTEAD PC
P.O. Box 50784
Dallas, Texas 75201
(214) 745-5400
Attorneys For Applicant